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ABSTRACT

This paper draws on the emerging literature on consultation and education (C and E) information systems as well as on experiences from an in-progress research project on consultation and education in four comprehensive community mental health centers. It (1) provides a brief review of the literature and state of the art of information systems for C and E; (2) discusses content to be included in an information system for C and E; and (3) presents a model and principles for implementing an information system for C and E services. (Author)

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DEVELOPING AN INFORMATION SYSTEM FOR CONSULTATION AND EDUCATION SERVICES IN COMMUNITY MENTAL HEALTH CENTERS

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INTRODUCTION

Although consultation and education (C&E) has been one of the essential services of community mental health centers (CMHCs) since Congress passed the first community mental health legislation in 1963, its development has lagged behind that of treatment-oriented services. Critical questions about the nature and scope of C&E services and the role of C&E within the CMHC system have remained unanswered. Research on the process and outcome of C&E activities has been minimal, and C&E has been found to be the least understood of the essential services of CMHCs (Glasscote, Sussex, Cumming, and Smith, 1969; Mannino and Shore, 1975; Norman and Forti, 1972).

While development of C&E services in CMHCs has been hampered by a number of social and organizational factors (Broskowski and Baker, 1974; Cherniss, 1977; Ketterer and Bader, 1977; Ketterer and Perkins, 1977b; Snow and Newton, 1976), one critical obstacle has been the absence of a comprehensive information system for indirect services/C&E--an information system which would permit the generation of knowledge about C&E and its role within the larger CMHC system (Carter and Cazares, 1976; Cytrynbaum, 1974, 1977; Flaherty, 1976; Hagedorn et al., 1976; McClung and Stunden, 1970; Parker and Terranova, 1969). Recently, however, increased attention has been focused on the need for documenting and evaluating C&E activities, and attempts to develop information systems for C&E have been reported in the literature (Broskowski, Driscoll, and Hayes, 1975; Broskowski, Driscoll, and Schulberg, in press; Cytrynbaum, 1974, 1977; Flaherty, 1976, 1977; Parker and Terranova, 1969). While important progress has been made, the development of information systems for C&E is still in a formative stage.

This paper draws on the emerging literature on C&E information systems as well as on experiences from an in-progress research project on consultation

and education in four comprehensive CMHCs (Bader and Dade, 1977; Ketterer and Bader, 1977; Ketterer and Perkins, 1977a) in discussing important issues related to the development of information systems for C&E services. Specifically, we will (1) provide a brief review of the literature and state of the art of information systems for C&E; (2) discuss content to be included in an information system for C&E; and (3) present a model and principles for implementing an information system for C&E services.

C&E INFORMATION SYSTEMS: THE STATE OF THE ART

In the last decade, there has been an outpouring of literature on management information systems for community mental health programs.[1] This literature identifies the purposes, functions, and components of information systems, discusses principles underlying their development, and presents procedures for installing such systems. It is important to note, however, that the literature has focused on the documentation of direct services while giving relatively little attention to information systems for indirect services.

Despite this lack of attention, progress has been made. In 1969, Parker and Terranova published a manual in which they indicated that the lack of an information system for indirect services threatened their continued existence. They stated:

> [The] segment of the mental health program which makes the mental health movement truly a part of the community is in jeopardy... A factor contributing to this state of affairs may well be the lack of information about community activities placed alongside patient data to make indirect services "visible" to decision makers.

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[1] See, for example, Cooper, 1973; Davidoff, Guttentag, and Offutt, 1977; Hagedorn, Beck, Neubert, and Werlin, 1976; Hargreaves, Attkisson and Sorenson, 1977; Person, 1969; Smith and Sorensen, 1974; Taube, 1969.

To address this deficiency, Parker and Terranova proposed a community mental health information system which would collect essentially the same information on all CMHC services, eliminating the distinction between indirect and direct services.

Cytrynbaum (1974, 1977) developed a comprehensive information system for monitoring and evaluating consultation activities of CMHCs. Describing a conceptual framework for the consultation process which provided a means of identifying and defining the content and parameters of a data base, Cytrynbaum then presented a set of instruments and procedures for recording essential information on consultation activities. The consultation process was subdivided into three major components--inception of consultation, events and dynamics in the consultation process, and termination and review of outcomes. For each component, key questions were identified and forms designed to collect that information. Cytrynbaum also suggested criteria for the review of consultation activities.

Flaherty (1976, 1977) also presented a system for monitoring and evaluating C&E services. Identifying the distinct phases of C&E activities, she discussed the critical questions to be asked about each phase and presented forms/procedures for gathering that information. In addition, she provided a helpful description of the process of developing and implementing a C&E information system in a CMHC. Flaherty's model was designed to meet the informational needs of a number of key users--the C&E staff, C&E administration, CMHC evaluation unit, and external funders. To ensure this, evaluators collaborated with C&E staff and administrators in all phases of the development, implementation, and evaluation of the C&E information system.

Another information system for indirect services is described by Broskowski, Driscoll, and Hayes (1975) and Broskowski, Driscoll, and

Schulberg (in press). These authors detail how their system monitors consultation services in human service organizations and accounts for staff time spent in production and maintenance activities. They also discuss the role of information systems in (1) planning and management; (2) cost-finding, rate setting, and budgeting; (3) internal evaluation and external accountability; and (4) personnel development. Finally, they highlight several important principles to consider when developing an information system for indirect services.[2]

Despite the above developments, information system technology for C&E has not been widely disseminated or applied. This lack of application is demonstrated through findings from our current research, which reveal that C&E staff are struggling with the problem of developing their information system technology. We have observed a lack of understanding of the nature, scope, and dimensions of C&E service and practice and the absence of procedures for implementing an information system for C&E.

Although our findings are based on a limited sample, we believe they reflect the state of the art in the field and for this reason merit elaboration. To begin with, we noted (1) a lack of knowledge about the nature and range of C&E activities; (2) absence of standard definitions of C&E services; (3) little consensus on C&E service and practice dimensions which would provide a basis for an information system; and finally, (4) lack of a typology for C&E services.

In addition, in terms of process, we noted that (1) existing data collection methods have typically emphasized counting activities of staff rather than documenting C&E projects as they unfold; (2) even when forms for

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[2]While their system was designed for a human service organization offering indirect services, it would address many of the informational needs of C&E units in CMHCs.

documenting projects have been developed, they often do not measure the full range of C&E activities;[3] (3) there is little continuity in data collection; (4) procedures for ensuring that forms are filled out accurately and on time are not employed; (5) there is an absence of standardized forms; (6) there are few centralized files for C&E project records; and finally (7) data feedback procedures are generally nonexistent.

Our findings suggest the need to address the above deficiencies, which can be conceptualized in terms of both content and process (content referring to the nature and complexity of C&E services; process referring to techniques and procedures for developing information systems). The next two sections will begin to address these issues by discussing important content of C&E information systems and by presenting a model and principles for implementing such systems. While the analysis of content primarily derives from observations and field experiences from our current research, the principles and procedures outlined in the final section draw more heavily on the literature on information systems, evaluation, and the field of research utilization.

CONTENT OF A C&E INFORMATION SYSTEM

While a portion of the literature on CMHC information systems (e.g., discussions of their purposes, principles, and implementation procedures) is applicable to the task of developing information systems for C&E, the content of these systems rarely captures the uniqueness of C&E. This can be attributed to the nature of C&E services, which are complex, broad-aimed, directed toward multiple audiences, and characterized by the use of diverse methods and a

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[3]Existing forms, for example, often illustrate a narrow conceptualization of C&E services, documenting long-term or more commonly known activities such as case consultation or caregiver consultation to the exclusion of short-term and one-time-only educational activities of C&E units.

range of goals (Carter and Cazares, 1976; MacLennan, Quinn, and Schroeder, 1971; Mannino and Shore, 1975).

Hagedorn et al. (1976) have pointed out that the nature and scope of C&E activities may be one of the primary factors inhibiting the development of adequate C&E documentation/evaluation methods. They state:

> C&E activities often are organizationally complex, have multiple goals, involve a spreading circle of persons not originally involved, and experience unanticipated consequences, both positive and negative. They are directly and quickly influenced by their own intended and unintended outputs. This further complicates the task of measuring their effectiveness.

Supporting the above observation, Cytrynbaum (1977) comments:

> A paramount reason for the limited development of methods for the analysis, classification, and evaluation of consultation activities is the range, breadth, and realistic complexity of consultation service functions...Community mental health center sponsored indirect service activities may simultaneously reflect a host of secondary, implicit, and competing personal, professional, organizational and political tasks or objectives.

Concurring, McClung and Stunden (1970) state:

> Consultation as typically practiced...lacks the consistency of procedure and method necessary for the experimental validation of effectiveness. This is the consequence of the lack of a uniform set of constructs leading to a description of the practices and procedures of consultation....

A Preliminary Typology of C&E Services

While the preceding observations illustrate the complexity of C&E activities, the range and breadth of C&E activities is well-illustrated by findings from our current study. Using multiple, sequentially-ordered data collection procedures including (1) review of relevant C&E and CMHC literature, (2) retrieval and analysis of archival records in four C&E units, (3) structured interviews with approximately 60 C&E and CMHC staff, and (4) field observations of C&E activities, project staff attempted to identify the range and type of C&E activities carried out in four

comprehensive CMHCs.[4] The following types of C&E activities were identified through these procedures:

A. C&E Services to the Community

1. Case Consultation - helping caregivers to help clients of their agency achieve treatment goals (focus is on specific clients)

2. Client Advocacy - assisting individuals in the community to secure needed resources or support

3. Caregiver Consultation - assisting professionals, paraprofessionals, and lay helpers to become more effective in carrying out their respective roles, as well as assisting them in developing ties to relevant professional agencies

4. Administrative Consultation - providing technical expertise to community organizations and administrators regarding program design, management, evaluation, and organizational process

5. Program Consultation - providing technical assistance to community agencies about the content of their programs

6. Grassroots Consultation - assisting informal groups to identify needs, to develop methods for meeting needs, and to seek resources

7. Network/Coalition Building - working in interagency or group coalitions to enhance community wellbeing, to share information and resources, and to address pressing social issues

8. Mental Health Education - informing the general public about services provided by the center and other organizations; changing knowledge/attitudes about mental health through public presentations, literature dissemination, use of media, etc.

9. Direct Prevention - working with normal and at-risk groups in order to increase their knowledge and skills

10. Community Crisis Intervention - intervening in community crises to reduce tension and to identify underlying problems/issues

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[4] An inductive analytic method was employed in order to identify the relationships between categories of observed C&E activities. This procedure was characterized by continued interaction between data collection and analysis, along with a gradual progression from observing C&E activities to defining categories of activities and then refining the categories. As this process continued, new categories of C&E activities were added, others were dropped, and still others were clustered into more clearly defined categories. Finally, in collaboration with C&E staff, consensus was reached on definitions of the discrete activity categories.

B. C&E Services Directed Toward the CMHC

1. Needs Assessment - systematically determining community needs for mental health services

2. Information Dissemination to CMHC - packaging information for center staff and board (e.g., newsletters, announcements of training programs, etc.)

3. CMHC Staff Development - planning for or providing in-service training for center staff

4. Monitoring or Evaluation - evaluating center-wide services

5. CMHC Board Consultation - providing information or assisting CMHC board in carrying out its functions

6. CMHC Staff Meetings - participating in meetings with non-C&E CMHC staff (e.g., CMHC supervisory meetings, general CMHC staff meetings, etc.)

7. CMHC Program Planning and Development - participating in developing center policy and procedures; planning and coordinating the delivery of CMHC services

8. CMHC Miscellaneous Tasks - performing other tasks related to the maintenance of the CMHC (e.g., preparing or writing grant proposals which will primarily benefit the center)

9. External Committee Work - representing center on committees which involve outside agencies

10. CMHC Staff Consultation - consulting with non-C&E CMHC staff who are delivering C&E services

C. C&E Activities Directed Toward the C&E Unit (C&E Planning and Maintenance Tasks)

1. Providing Supervision - providing information and direction for C&E staff performing C&E-related activities and functions

2. Receiving Supervision - receiving information and direction from designated supervisor on C&E-related activities and functions

3. C&E Staff Collaboration - informal sharing of information with C&E staff related to C&E activities and functions

4. C&E Staff Meetings - participating in meetings of C&E unit

5. C&E Program Planning and Development - planning and coordinating the delivery of C&E programs and services

6. C&E Information/Evaluation System - developing and maintaining an information/evaluation system for C&E activities

7. Record Keeping - recording information relative to C&E services and/or activities

8. Staff Development and Training - planning for and participating in in-service training for C&E staff

9. C&E Grant Writing - preparing grant proposals which will primarily benefit the C&E unit

10. Coordination of C&E Services - coordinating C&E services throughout the CMHC system

Although the above list of C&E activities is still evolving, it reflects the range of activities in the four participating C&E units and is important for several reasons: first, it grew out of the experience of C&E practitioners in a variety of settings and thus reflects the comprehensiveness and "reality" of C&E services; second, it enabled researchers and C&E staff to communicate more effectively about that "reality;" third, it made possible the development of an information system which would tap the full range of C&E activities.

Dimensions of C&E Services

Given the range of C&E activities described above, it is apparent that C&E programs are much more complex than is commonly understood. Because of our lack of understanding of this neglected component of CMHCs, it is important to identify relevant dimensions of C&E service and practice. These dimensions, if explicated, would provide a basis for developing an information system and would contribute to the development of knowledge about consultation and education.

Findings from our study reveal a number of dimensions which should be included in a comprehensive information system for C&E. Increasing

our knowledge about the service dimensions listed below is expected to provide mental health planners and administrators as well as C&E staff with a basis for setting program priorities and developing program designs capable of meeting the needs of different community groups. Generating knowledge about the practice dimensions below will result in identification of the knowledge, skills, and methods required to carry out different types of C&E services. Such findings can be used as a basis for developing staff training materials and for improving C&E practice.

The following list of service and practice dimensions is accompanied by a series of questions designed to elaborate on the nature and content of each dimension.

A. Service Dimensions

1. Goals/Objectives

   a. What are the short- and long-range objectives of the project (e.g., change in recipient's attitudes, behaviors, knowledge, etc.)?
   b. If there are multiple objectives, which ones have priority?
   c. Are the objectives stated in ways that permit them to be evaluated?
   d. How will consultants/consultees know when goals have been realized?
   e. On what basis were the goals set (e.g., community needs, staff preferences, federal guidelines, etc.)?
   f. Were the goals determined collaboratively? With whom?
   g. What was the method of agreeing/contracting on goals?
   h. What potential problems are seen in goal achievement (strengths/weaknesses of consultants or consultees or their respective organizations which may affect goal achievement)?

2. Recipient systems

   a. Who is the direct recipient of the C&E service?
   b. What is the role or function of the recipients in the community?
   c. Are the recipients part of a formal, semi-formal, or informal group?
   d. What other characteristics describe the primary recipient group (e.g., socio-economic characteristics, size of group, location in community, etc.)?
   e. What are the unique needs or resources of the recipient system?
   f. Is there a secondary recipient system? If so, describe.
   g. What is the connection, if any, between the direct and secondary recipients of service?
   h. How might this linkage be made more explicit?

3. Demand/Motivation for service

   a. Where did the request for service originate?
   b. What reasons were given for requesting/initiating C&E service? (What about covert or hidden reasons?)
   c. If problems were presented, rate the severity of the presenting problems.
   d. What is the desired outcome of this intervention (i.e., what will success look like)?
   e. What factors explain the demand or motivation for service (e.g., crisis in recipient system, need for more resources, desire to work collaboratively with professional C&E staff, C&E staff initiatives/leadership)?
   f. Why did C&E staff decide to work with this recipient system (reason for responding to request for service)?
   g. How was recipient interest/motivation in the service sustained during the project (i.e., what is the quid pro quo)?

4. Rationale for service

   a. On what theoretical rationale is the service built?
   b. What value assumptions are implicit in the C&E service?
   c. How does the service relate to or affect other C&E services or direct services?

5. Content of service

   a. What is the specific content (knowledge, information, methods, etc.) being transferred to the recipient system?
   b. Did the content change over time?
   c. Where did the content originate (mental health theory, knowledge of community resources, etc.)?
   d. What form is it in (packaged into formal presentation, video tape, written material, etc.)?

6. Time-frame

   a. Is the project a short-term (or one-time-only) intervention, or does it take place over a long period of time?
   b. What is the time-frame for achieving short- and long-range objectives?
   c. What determines the length of the project?
   d. What is the frequenc of contacts between consultant and consultee system?

7. Process

   a. What is the natural cycle of events for this service (e.g., planning, entry, contracting, implementation, termination, evaluation, follow-up)?
   b. What were the critical events/issues/problems in each phase of the intervention (initial contracting, midpoint, termination, etc.)?
   c. What implications did these critical events have for the subsequent delivery of the C&E service?
   d. What special problems were encountered in providing the service?
   e. How were these problems/conflicts resolved?

8. Evaluation

a. What criteria were used to evaluate the C&E service (e.g., criteria of adequacy, effectiveness, efficiency, extensiveness, acceptability, appropriateness, etc.)?
b. What criteria could be used in the future?
c. How would one begin to think about evaluating the process and outcome of such an intervention?
d. To what extent do C&E consultants and recipients feel that the objectives of the project have been met?
e. What objectives were achieved and not achieved?
f. What evidence is there for achievement of objectives?
g. What is the subjective evaluation of the consultant/client system interaction?
h. What unexpected positive or negative outcomes occurred as a result of the service?

B. Practice Dimensions

1. Roles

a. What roles do C&E staff fill in implementing different intervention activities (e.g., facilitator, broker, educator/teacher, needs assessor, trainer, mental health consultant)?
b. In which roles does the consultant most often function? Why?
c. What roles are assumed by members of the recipient system(s)?
d. To what extent do recipient roles parallel or complement roles assumed by C&E staff? Is there competition? If so, how is it resolved?
e. Did particular phenomena ("status," degrees, subject area expertise, demographic characteristics, personality characteristics of consultants) help or hinder C&E staff in carrying out their roles?

2. Methods/Techniques

a. What specific methods/techniques do C&E workers use in delivering a C&E service (e.g., training techniques, video tapes, needs assessment, meetings, lectures, problem-solving sessions)?
b. What methods/techniques are most helpful during the delivery of C&E services? Why? (These, of course, vary during the life of the project from initial contact to termination.)
c. Did shifts in methods/strategies occur?

3. Skills/Experience/Resources of Consultant

a. What practice skills are required to effectively implement this project (listening skills, verbal skills, conceptual ability, rapport with community recipients, experience in community problem solving, etc.)?
b. What skills/experience/resources of the consultant were particularly important in delivering the service?

4. Practice theory

   a. What practice knowledge or theory is explicitly or implicitly drawn on in delivering the service (e.g., administrative consultation may borrow from organization development or management consulting; community consultation from community organization practice)?

The above service and practice dimensions reflect important content to be included in a comprehensive C&E information system.[5] Data on these dimensions would (1) provide ongoing information for planning and decision-making; (2) facilitate the development of a refined typology of C&E services; and (3) increase our knowledge about the field of C&E. Future work should be directed toward developing a more comprehensive list of dimensions and refining them through the collection of data.

The next section discusses principles and procedures for developing and implementing a comprehensive information system for C&E.

PRINCIPLES AND PROCEDURES FOR DEVELOPING A COMPREHENSIVE INFORMATION SYSTEM FOR C&E

In this section a set of principles and procedures for developing and implementing an information system for C&E will be presented. This eight-step model outlines procedures applicable to the development of information systems in a variety of settings. The procedures and the principles linked with each step are drawn from the literature on CMHC information systems, evaluation, and research utilization, as well as from the experiences of our research staff in developing such a system for C&E units.

The model is presented below:

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[5] In addition to the content included in the service and practice dimensions, an information system for C&E would collect other data (for example, basic identifying information on the consultee and consultant and their respective systems).

STEP 1. Assess the Readiness and Level of Evaluability of C&E.

a. Determine whether the goals of the C&E unit are clearly stated.

b. Determine whether the C&E services delivered are extensive enough to merit an information system.

c. Assess the C&E unit and CMHC's capacity for collecting data on a routine basis.

PRINCIPLE:

- Unless the C&E unit and the CMHC have attained a minimum level of readiness and have developed the capability of collecting information routinely, an information system cannot be implemented.

STEP 2. Assess the Support for Implementing an Information System.

a. Determine the level of administrative and staff support for an information system.

b. Determine the willingness of administration and staff to participate in setting up an information system.

PRINCIPLE:

- Support of top administrators, managers, and staff is essential to the successful development and implementation of an information system. Willingness of staff to participate in routine data collection is also essential to successful development and implementation of an information system.

STEP 3. Assess the Adequacy of Resources for Implementing an Information System.

a. Determine what resources (money, staff who can be freed up for information system development, etc.) will be available for developing and implementing an information system.

b. Determine what technical expertise exists in the center.

c. Assess the adequacy of the data processing technology of the CMHC.

PRINCIPLE:

- Unless adequate resources (money, staff time, expertise, data processing technology, etc.) for a comprehensive information system are available, such a system cannot be implemented. Firm commitments on resources must be gained from top administrators.

STEP 4. Identify Relevant Participants Who Will Help Develop and Later Use the Information System or Its Findings.

a. Identify and involve staff in C&E unit.

b. Identify and involve staff in evaluation unit.

c. Identify and involve administrative/management personnel.

PRINCIPLE:

- Critical personnel at all levels of the organization must be involved in developing the information system. They will not only make valuable contributions, but their participation will increase their support of the system when it is implemented. Incentives for participation must be built in.

STEP 5. Identify Informational Needs of C&E Units.

a. Meet with C&E staff to identify content relevant to ongoing program planning and service delivery.

b. Share with staff dimensions found to be important in other C&E units/CMHCs both locally and nationally.

c. Discuss with staff the relevance of such content to C&E planning and decision-making tasks.

d. Involve staff in the selection of critical content for inclusion in the data system.

e. Review with staff alternative procedures and formats for collecting and disseminating relevant information on C&E services.

PRINCIPLES:

- Before developing an information system, informational needs of program personnel at all levels of the organization should be identified, in order that the system will be capable of gathering informaton to meet their needs.

- An information system must be viewed as an integral part of decision-making. Elpers and Chapman (1977) stress that "the management information system cannot be an isolated activity, but must be integral to the planning, monitoring, and program innovation processes."

- Questions that need to be answered should be specified in advance, and these questions should be used to determine data to be gathered. "Fishing expeditions" should be avoided.

STEP 6. Develop Overall Design for the Information System, Tailoring Instruments to the Data Processing Capability of the System.

a. Devise overall plan which includes mechanisms for data collection, analysis, and feedback. Review with staff.

b. Develop procedures for ensuring timely data collection, accuracy, simplicity, flexibility, comprehensiveness, confidentiality.

c. Develop codes which accurately describe C&E service dimensions.

d. Develop forms/methods which assess the relevant content previously identified by staff and which measure the full range of C&E activities. (Minimally, these forms would include (1) staff activity forms; (2) initial project forms, including basic project description and plan for implementation; (3) progress notes, if applicable; and (4) termination and assessment forms.

e. Revise forms in collaboration with representatives from C&E units.

f. Train staff to use forms.

PRINCIPLES:

- An information system should be designed to be comprehensive. However, because of limitations of resources, choices concerning what to collect routinely and what to collect periodically need to be made. Cooper (1973) states:

> The statistical subsystem must be a compromise between the extremes of including, on a continuing basis, all types of data of possible utility and collecting no data. The ongoing system should include all data of planned utility supplemented by ad hoc projects for unplanned but necessary purposes.

- It is important to design a system that will minimize demands on staff for data. One way of doing this is to design forms so that information reported on one form meets multiple informational needs.

- An information system that is designed to be as simple as possible and still collect needed information will be easiest to implement. Arguing for a simplified information system, Cooper (1973) states:

> Every effort should be exerted to make all aspects of the information system as simple as possible, from concept to analysis, from input to output. This contributes to staff understanding of their functions and to understanding of the end product.

- Procedures and forms should be flexible enough to meet changing needs of C&E units and CMHCs. Smith and Sorensen (1974) state that an information system "should be designed with sufficient flexibility so changes can be made without disturbing routine operations. Flexibility is necessary so the changing demands for reports can be addressed with adequate information."

- If procedures for collecting accurate, timely data are not ensured, informational outputs may be worse than none at all. Remember the old maxim "garbage in--garbage out." Smith and Sorensen (1974) state that "checks, reviews, and edits of input data, processing of data, and output data are necessary if the yield of a management information system is going to be usable."

- Confidentiality issues must be addressed when designing an information system. Procedures ensuring protection of the rights of staff and recipients of service should be built into the information system from the beginning.

STEP 7. Implement Information System.

a. Pilot test forms with selected C&E staff.

(1) Train selected C&E staff in correct procedures for recording data.

(2) Maintain two-way communication about piloted system.

b. Analyze data from pilot and revise forms.

(1) Analyze data collected from pilot work in C&E unit.

(2) Compare data generated with previously identified information needs.

(3) Review forms and data collection procedures with relevant staff.

(4) Revise forms and procedures.

c. Implement the revised information system throughout the C&E unit.

(1) Train relevant staff in correct procedures for recording data.

(2) Provide ongoing consultation to staff related to C&E data system.

(3) Monitor and analyze data collected from all centers.

PRINCIPLES:

- Sufficient time should be allowed for developing and implementing the information system. The experience of Elpers and Chapman (1977) speaks to this principle:

> Getting a management information system established is not an overnight process. [We] spent a year getting ready to design such a system--time spent in committing management, in agreeing upon the need, exploring alternatives to a major effort. Six months were spent in designing the system, several months in implementing the system and programming the data processing. The system became functional only after 15 months of intensive effort. We anticipate that the system will continue to progress and change.

- An information system should be developed and installed in time to monitor events as they occur, capturing information as it evolves rather than gathering data retrospectively. This principle is supported by Cooper (1973), who states: "Prospective data collection methods are necessary not only for maximizing efficiency and minimizing costs but because it may be impossible, inaccurate, or undesirable to establish data collection procedures on a retrospective basis."

- An incremental approach should be used in installing information systems, especially if the systems are comprehensive.

STEP 8. Develop Mechanisms for Ongoing Feedback and Evaluation.

a. Provide ongoing feedback to the C&E unit and CMHC about information system findings, which can be used for management, program planning, and program development. The purpose of this information is to improve the C&E unit and the CMHC.

b. Continually assess the adequacy of information system process and products so that required modifications can be made in the system. The purpose of this assessment is to improve the information system. Criteria which could be used in evaluating the adequacy of the information system include the following:

(1) Relevance of the data to C&E planning and decision-making tasks;

(2) Extent to which relevant data are made available to C&E staff;

(3) Extent to which data from the information system are actually used in the centers;

(4) Extent to which the procedures and forms included in the C&E information system are incorporated into the center's ongoing management information system.

PRINCIPLES:

- A mechanism must be developed to ensure prompt and timely informational feedback to relevant audiences.

- Information must be fed back to staff in a form which is clear, understandable, and useful. Instead of distributing standardized reports containing unrequested information, tailored reports containing information requested by staff should be distributed, whenever possible.

- Two-way communication between evaluators and program staff should be maintained. In particular, staff feedback should be sought and attended to, and complaints about the information system should be addressed in a positive manner. Smith and Sorensen (1974) state:

> Despite the sophistication of a system in providing relevant information needs of an organization, someone within the organization is going to complain about input preparation, report formats, timing, etc. Such thorns are almost impossible to avoid. These responses could be dealt with by selling the merits of the system, compromising, coercion, and sometimes by ignoring their existence.

- Even after the system is operational, constant monitoring is needed to ensure the continued relevance of the information system. Commenting on the need for constant vigilance, Smith and Sorensen (1974) state:

> Care should be taken that all information input is accurate and timely. Reports should be carefully analyzed to determine their usefulness. The absence of monitoring can permit internal processing problems, which if not corrected, have a snowball effect and become difficult to correct.

It was stated earlier that the principles and procedures detailed in the above model were applicable to the development of information systems in a variety of settings. In applying this model, however, it is important to note that attempts to develop C&E information systems have in the past been hampered because "systems experts" were not cognizant of the nature of C&E. Indeed, they often seemed to have a direct service mind set, and consequently designed systems which were unable to capture, document, or adequately describe broad-aimed C&E activities. In this context, knowledge about information

systems is not enough; what is needed is an understanding of the uniqueness of C&E and the ways in which it differs from direct services. Special problems of documenting C&E services, as well as the different content required in a C&E information system, must be clearly understood.

CONCLUSIONS

This paper has reviewed the literature on C&E information systems and reported findings from research on the information system capacity of four C&E units. Two major deficiencies hindering the development of information systems for C&E have been highlighted: (1) a lack of knowledge about the nature, scope, and dimensions of C&E service and practice; and (2) a lack of procedures for developing and implementing C&E information systems in the field. To address these deficiencies, we presented a preliminary classification of C&E activities and identified critical dimensions of C&E service and practice to be included in an information system for C&E. In addition, we outlined a model for implementing an information system in C&E units, consisting of eight sequential steps along with a set of principles underlying each step.

The above material highlighted a number of important themes. It has been noted, for example, that a serious gap exists between the development of new information system technologies for C&E and their application in practice settings. We have also noted that information systems must be tailored to the unique nature and scope of C&E activities. Finally, it appears essential that increased attention be focused not only on developing and implementing C&E information systems but on reporting how findings from such systems are being used to improve ongoing service activities. In this regard, C&E information systems must be viewed as a first step toward evaluating the effect of C&E services on diverse community systems.

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